Working Group to Address the Future of RHIC Physics via High p_T Observables

Kirill Filimonov
Saskia Mioduszewski
Denes Molnar

29 April 2005

The Nature of the Game

- Some of the current questions will be addressed with run-4 and run-5 data, now on tape

→ Some answers will lead to new questions

- We will soon see what questions will arise from the measurement to be made in the near future

This is research!

Goals of this Workshop

- Summarize the current physics questions that can be addressed via high p_T observables in the future
- Make a list of the measurements that need to be made
- Which questions require upgrades (detector and/or luminosity)?
- Define what calculations/simulations need to be done (and who will do it)

Summary of the Ideas on the List-server I

Physics Questions:

- Energy loss
  - Length dependence
  - Quark vs. glue
  - Light vs. heavy quarks
  - Away side jet expectation (thermalization?)
- Hadronization – fragmentation, coalescence, percolation
- Hadronization in A+A vs. p+p
- CGC vs. jet quenching at forward rapidities

Summary of the Ideas on the List-server II

Physics Questions (cont'd):

- Source of v_2 at high p_T

Theoretical challenges:

- What exactly does q-hat "measure"?
- Effect of a propagating hard parton on medium
- Consistent description of coalescence/recombination

Summary of the Ideas on the List-server III

Measurements:

- γ– jet and leading hadron –γ correlations
- Away-side jet cone
  - Energy distribution
  - Shape
  - Flavor
- Identified particle R_{AA}, and v_2
  - Baryon vs. meson
  - Forward vs. central rapidity
  - Light vs. heavy flavor

Request to Working Group

Experimentalists:

- What calculations are needed from the theory community?

Theorists:

- What measurements are needed?